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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,436	03/18/2004	Michael M. Kugelman	21220/04142	5431

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EXAMINER	
AMRANY, ADI	

ART UNIT	PAPER NUMBER
2836	

DATE MAILED: 07/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/803,436	KUGELMAN ET AL.	
	Examiner	Art Unit	
	Adi Amrany	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 12-20* is/are rejected.

7)☒ Claim(s) *6-11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 September 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/8/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 20 is objected to because the phrase "based on a control of power to the load" is confusing and unclear. The claim will be interpreted as reciting that the steps of enabling and disabling are triggered on the application and removal of power to the load.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Chang (US 5,892,677).

With respect to claim 1, Chang discloses a solid state relay (figure 2a, item Sa; figure 2b; column 4, lines 35-44) coupleable to first and second phase busses of an AC power source (figure 2a, items ai, PT2) for switching power from said first and second phase busses to a load, said solid relay comprising:

first and second power semiconductors (figure 2b; column 4, lines 35-37) connected in a series circuit configuration and coupleable to said first and second phase busses for switching power from said first and second phase busses to

said load, each of said first and second power semiconductor switches controllably operative in conductive and non-conductive states (column 5, line 42 to column 6, line 23);

first and second power diodes (figure 2b; column 4, lines 37-39) coupled respectively across said first and second power semiconductor switches; and

a control circuit (figure 2a, "control and gate drivers"; figure 5, item 44; column 5, lines 16-41) for monitoring a polarity relationship of said fist and second phase busses and controlling said fist and second switches between conductive and non-conductive states based on said monitored polarity relationship.

With respect to claim 2, Chang discloses the relay of claim 1, and further discloses the first and second power diodes are coupled respectively across the first and second power semiconductor switches in a circuit configuration to block current to the load when both of the first and second power semiconductor switches are in a non-conductive state (column 4, lines 37-39; column 5, lines 59-65).

With respect to claim 3, Chang discloses the relay of claim 2, and further discloses the series circuit configuration of the first and second power semiconductor switches is coupled in series with the load (figure 2a, series connection of switches [Sa] and load [Voi]); and wherein the series circuit configuration of the load and first and second power semiconductor switches is coupled across the first and second phase busses (figure 2a; switches [Sa] and load [Voi] coupled across busses [ai and PT2]).

With respect to claim 12, Chang discloses the relay of claim 1, and further discloses one of the first and second phase busses is a neutral phase bus (figure 2a, item PT2).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 4-5 and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang (US 5,892,677) ('677) in view of Chang (US 6,778,414) ('414).

With respect to claim 4, Chang '677 discloses the relay of claim 1, but does not expressly disclose the control circuit is governed by an enable signal.

Chang '414 discloses that the solid state relay and control circuit is contained within an aircraft. The relay and control circuit use the power supply of the aircraft, consisting of engine power and backup batteries.

It would be obvious to one skilled in the art that Chang '414 discloses the control circuit is governed by an enable signal (column 2, lines 50-57) to control the fist semiconductor switch between a conductive and non-conductive states based on a transition of a first polarity to a second polarity relationship between the first and second phase busses and to control the second semiconductor switch between conductive and non-conductive states based on a transition of the second polarity to the first polarity

relationship between the first and second phase busses. In a system with limited power, one skilled in the art would configure electrical systems with an on/off (enable/disable) function to prevent the drain of power from the batteries when the engines are off. One skilled in the art would configure the Chang '414 control circuit to comprise and on/off signal (enable/disable) to introduce an AC voltage to the solid state relay system.

With respect to claim 5, Chang '677 discloses the relay of claim 1. As discussed above, it would have been obvious to one skilled in the art that Chang '414 discloses the control circuit is governed by an enable signal that is generated from a source for controlling power to the load. The source in Chang '414 is the aircraft engines and/or backup batteries.

With respect to claim 15, Chang '677 discloses the apparatus necessary to complete the recited method of operating a solid state relay coupled to first and second phase busses of an AC power source for switching power from said first and second phase busses to a load, comprising the steps of:

including in said solid state relay a series circuit configuration of first and second power semiconductor switches for coupled to said first and second phase busses (figure 2b; column 4, lines 35-37), and fist and second power diodes coupled respectively across said first and second power semiconductor switches (figure 2b; column 4, lines 37-39); and

monitoring a polarity relationship of said fist and second phase busses (figure 2a, "control and gate drivers"; figure 5, item 44; column 5, lines 16-41);

Chang '677 does not expressly disclose the steps of enabling and disabling said solid state relays or sequentially controlling the first and second switches to a conductive or non-conductive states.

Chang '414 discloses that the solid state relay and control circuit is contained within an aircraft. The relay and control circuit use the power supply of the aircraft, consisting of engine power and backup batteries.

It would be obvious to one skilled in the art that Chang '414 discloses the method comprises the step of enabling said solid state relay to supply power from said first and second phase busses to said load, disabling said solid state relay from supplying power from said first and second phase busses to said load, upon said solid state relay being enabled, controlling said first and second switches sequentially to a conductive state based on said monitored polarity relationship, and upon said solid state relay being disabled, controlling said first and second switches sequentially to a non-conductive state based on said monitored polarity relationship (column 2, lines 50-57). In a system with limited power, one skilled in the art would configure electrical systems with an on/off (enable/disable) function to prevent the drain of power from the batteries when the engines are off. One skilled in the art would configure the Chang '414 control circuit to comprise and on/off signal (enable/disable) to introduce/remove AC voltage to the solid state relay system.

With respect to claims 16-17, Chang '677 and '414 disclose the method of claim 15, and Chang '677 discloses the apparatus necessary to complete the recited methods, as discussed above in the rejections of claims 2-3, respectively.

With respect to claims 18-19, Chang '677 and '414 disclose the method of claim 15, and Chang '677 discloses the apparatus necessary to complete the recited methods, as discussed above in the rejections of claim 4.

With respect to claim 20, Chang '677 and '414 disclose the method of claim 15, and further, it would be obvious to one skilled in the art that Chang '414 discloses the steps of enabling and disabling are based on a control of power to the load. The operation of the solid state relay would be based on whether power is supplied from the aircraft engines or backup batteries. When the aircraft is shut down, power is removed from the load, and the switches would be disabled.

6. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang ('677).

With respect to claim 13, Chang discloses the relay of claim 1, and further, it would have been obvious that the first and second semiconductor switches each comprises a power field effect transistor. Chang discloses the semiconductor switches are bipolar junction transistors (figure 2b; column 4, lines 35-37). It is well known in the art that the bipolar junction transistor and a field effect transistor may be interchangeably used as switches.

With respect to claim 14, Chang discloses the relay of claim 13, and further, it would have been obvious that the control circuit is coupled to gate junctions of the power field effect transistors for controlling the first and second switches between conductive and non-conductive states based on the monitored polarity relationships. Chang discloses that the control circuit is coupled to the base of the BJT. One skilled in

the art would recognize that a control signal applied to the base of a BJT would result in the same switching effect between the emitter and collector as a control signal applied to the gate of a FET to control the conducting and non-conducting states between the drain and source.

Allowable Subject Matter

7. Claims 6-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: With respect to claims 6-7, the prior art does not teach or suggest isolating a solid state relay control circuit from the enable signal source. With respect to claims 8-11, the prior art does not teach or suggest a floating power source to power the solid state relay control circuit or an opto-coupler to isolate the control circuit from the AC power source.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adi Amrany whose telephone number is (571) 272-0415. The examiner can normally be reached on weekdays, from 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (571) 272-2800 x36. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BURTON S. MULLINS
PRIMARY EXAMINER

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